Notice of Allowability	Application No.	Applicant(s)	
	10/606,623	EID ET AL.	
	Examiner	Art Unit	
	Devona E. Faulk	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed on 10/31/2007*.

2. ☒ The allowed claim(s) is/are *4-10,12-14,17-24,26-31,33-58*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 10/31/2007, with respect to the rejection(s) of claim(s) 4-7,9,11-17,21-27,30-34,38-43,45-48,50-54 and 56-58 under 103(a) have been fully considered and are persuasive regarding the amended claim language. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection would have been made in view of112 2nd. The examiner has also determined that the amendment to claims 39 and 50 did not place them in allowable form.

2. The applicant amended the claims and the examiner noted that some of the amended claim language was confusing. The applicant agreed to an examiner's amendment to place all the claims in allowable form.

3. Claims 8,10,18-20,28,29,35 and 36 were indicated as allowable and remain in allowable form.

4. Claims 1-3,11,15,16,25 and 32 are cancelled.

EXAMINER'S AMENDMENT

5. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Amir N. Penn (Reg. No. 40,767) on 10/31/2007.

The claims are to be amended as follows:

Claims 4, 7,9,12-14, 21,24,26,30,31,33,34,37-41,43,45,47,50,51,52,54,56 and 58 are to be amended in the following manner:

4. A method for processing a plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, comprising:

producing a plurality of [[n]] initial low frequency input signals that comprise portions of the plurality of [[n]] audio input signals that are at most about a cut-off frequency;

producing at least one additional low frequency input signal from the plurality of [[n]] initial low frequency input signals;

producing a plurality of [[n]] high frequency input signals that comprises portions of the plurality of [[n]] audio input signals that are at least about the cut-off frequency;

decoding the plurality of [[n]] high frequency input signals into a plurality of [[m]] high frequency output signals according to a matrix decoding technique;

bypassing decoding of the said plurality of initial [[n]] low frequency input signals and the additional low frequency input signal by any matrix decoding technique; and

maintaining each of the said plurality of [[n]] initial low frequency input signals and the additional low frequency input signal separately from each other, where the plurality of [[m]] high frequency output signals, the plurality of [[n]] initial low frequency input signals, and the additional low frequency input signal are included in the plurality of audio output signals.

7. The method of Claim 4, where decoding the plurality of [[n]] high frequency input signals into the plurality of [[m]] high frequency output signals further comprises producing at least one additional high frequency output signal.

9. The method of Claim 4, where producing the plurality of [[n]] initial low frequency input signals comprises removing frequencies that are above about the cut-off frequency from ~~at least one~~ each of the plurality of [[n]] audio input signals.

12. The method of Claim 4, where producing the additional low frequency input signal comprises producing an additional [[m-n]] plurality of low frequency input signals as a function of the plurality of [[n]] initial low frequency input signals.

13. The method of Claim 12, where the plurality of [[n]] initial low frequency input signals comprises a low frequency effects signal, and producing the additional [[m-n]] plurality of low frequency input signals further comprises producing the at least one of the additional [[m-n]] plurality of low frequency input signals as a function of the low frequency effects signal.

14. The method of Claim 13, where producing the additional [[m-n]] plurality of low frequency input signals further comprises applying a gain to the low frequency effects signal.

21. A system for processing a plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, comprising:

a bass management module in communication with the plurality of audio input signals configured to produce a plurality of [[n]] initial low frequency input signals comprising portions of the plurality of audio input signals that are at most about a cut-off frequency, produce at least one additional low frequency input signal from at least one of the plurality of [[n]] initial low frequency input signals, and produce a plurality of [[n]] high frequency input signals comprising portions of the plurality of audio input signals that are at least about the cut-off frequency;

a matrix decoder module in communication with the bass management module and configured to decode the plurality of [[n]] high frequency input signals into a plurality of [[m]] high frequency output signals; and

a plurality of low frequency input channels in communication with the bass management module, configured to separately communicate each of the plurality of [[n]] initial low frequency input signals and the additional low frequency input signal, and bypass any matrix decoder module, where the plurality of [[n]] initial low frequency input signals, the at least one additional [[m-n]] low frequency input signal, and the plurality of [[m]] high frequency output signals comprise the plurality of audio output signals.

24. The system of Claim 21, where the matrix decoder comprises a mixer configured to produce at least one additional high frequency output signal, whereby the plurality of [[m]] high frequency output signals include the additional high frequency output signals.

26. The system of Claim 21, where the bass management module comprises a low-pass filter comprising the cut-off frequency, in communication with the plurality of audio input signals, and configured to produce the plurality of [[n]] initial low frequency input signals.

30. The system of Claim 21, where the at least one additional [[m-n]] low frequency input ~~signals are~~ signal is produced from at least some of the plurality of [[n]] initial low-frequency input signals.

31. The system of Claim 30, where the plurality of audio input signals comprises a low-frequency effects signal, and where the at least one [[of the]] additional [[m-n]] low frequency input ~~signals are~~ signal is produced from the low-frequency effects signal.

33. The system of Claim 21, where the bass management module comprises a high-pass filter including the cut-off frequency, is in communication with the plurality of audio input signals, and is configured to produce the plurality of [[n]] high frequency input signals.

34. The system of Claim 21, further comprising a mixer in communication with the plurality of [[n]] initial low frequency input signals, the at least one additional [[m-n]] low frequency ~~input signals~~ signal, and the plurality of [[m]] high frequency output signals, and is configured to combine the plurality of [[n]] initial low frequency input signals and

the at least one additional [[m-n]] low frequency ~~input signals~~ signal with the plurality of [[m]] high frequency output signals.

37. A vehicular sound processing system, comprising:

a signal source configured to produce a plurality of audio input signals;

a system in communication with the sound source and configured to decode the plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, the system comprising:

a bass management module in communication with the plurality of audio input signals, configured to produce a plurality of [[n]] initial low frequency input signals comprising portions of the plurality of audio input signals that are at most about a cut-off frequency, an additional [[m-n]] plurality of low frequency input signals from the plurality of [[n]] initial low frequency input signals, and ~~a plurality of~~ n high frequency input signals comprising portions of the plurality of audio input signals that are at least about the cut-off frequency;

at least one matrix decoder module in communication with the bass management module and configured to decode the plurality of [[n]] high frequency input signals into a plurality of [[m]] high frequency output signals, the plurality of high frequency output signals being a greater number than the plurality of high frequency input signals;

a plurality of low frequency input channels in communication with the bass management module configured to separately communicate each of the plurality of [[n]] initial low frequency input signals and the additional [[m-n]] plurality of low frequency input signals, and bypass any matrix decoder module, where the plurality of [[n]] initial low frequency input signals, the additional [[m-n]] plurality of low frequency input signals, and the plurality of [[m]] high frequency output signals comprise the plurality of audio output signals; and

a plurality of speakers in communication with the system and configured to convert the plurality of output signals into a plurality of sound waves.

38. A vehicular sound processing system, comprising:

a signal source configured to produce a plurality of audio input signals;

a system in communication with the sound source and configured to decoding the plurality of audio input signals into a plurality of audio output signals, the system comprising:

bass management means for producing a plurality of [[n]] initial low-frequency input signals that include portions of the plurality of audio input signals that are at most about a cut-off frequency, an additional [[m-n]] plurality of low frequency input signals from the plurality of [[n]] initial low frequency input signals, and a plurality of [[n]] high-frequency input signals that include portions of the plurality of audio input signals that are at least about the cut-off frequency;

matrix decoder means for decoding the plurality of [[n]] high frequency input signals into a plurality of [[m]] high frequency output signals; and

means for separately communicating each of the plurality of [[n]] initial low frequency input signals and the additional m-n low frequency input signals, and bypassing any matrix decoder means, where the ~~plurality of~~ n initial low frequency input signals, the additional [[m-n]] plurality of low frequency input signals, and the plurality of [[m]] high frequency output signals comprise the plurality of audio output signals; and

a plurality of speakers in communication with the system, where the plurality of speakers converts the plurality of output signals into a plurality of sound waves.

39. A method for processing a plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, the method comprising:

producing ~~at least n+1~~ a plurality of initial low frequency input signals that comprises portions of at least some of the plurality of audio input signals that is at most about a cut-off frequency;

producing at least one additional low frequency input signal as a function of at least one of the plurality of initial low frequency input signals;

decoding, according to at least one matrix decoding technique, at least a part of the plurality of audio input signals into a plurality of [[m]] decoded signals;

bypassing the ~~at least n+1~~ plurality of initial low frequency input signals and the at least one additional low frequency input signal by any matrix decoding technique; and

generating the plurality of audio output signals based on the plurality of decoded signals, based on the at least one additional low frequency signal, and based on the ~~at least n+1~~ plurality of initial low frequency input signals.

40. The method of claim 39, where producing a plurality of initial low frequency input signals comprises producing a plurality of initial low frequency input signals that comprise portions of the plurality of audio input signals that are at most about a cut-off frequency; and

where bypassing comprises bypassing the plurality of initial low frequency input signals and the at least one additional low frequency input signal by any matrix decoding technique.

41. The method of claim 40, where a number of the plurality of audio input signals is less than a number of the plurality of initial low frequency input signals and the at least one additional low frequency input signal; ~~and~~

~~where producing the plurality of low frequency inputs signals comprises:~~

~~producing a plurality of initial low frequency input signals that comprise portions of the n audio input signals that are at most about a cut-off frequency; and~~

~~producing at least some of the plurality of low frequency input signals as a function of the initial low frequency input signals~~.

43. The method of claim 40, where a number of the plurality of initial low frequency input signals equals the number of the plurality of audio input signals; and

where the plurality of initial low frequency input signals is generated by filtering the plurality of audio input signals; and

~~where at least one of the plurality of low frequency input signals is produced as a function of the initial low frequency input signals and a remainder of the plurality of low frequency input signals are identical to the initial low frequency input signals~~.

45. The method of claim 39, where decoding comprises decoding from a lesser number of input signals to a greater number of decoded signals;

where a number of the plurality of initial low frequency input signals is less than the number of decoded signals; and

where each of the plurality of initial low frequency input signals are maintained separately from each other; and

where the plurality of initial low frequency input signals are combined with some of the corresponding decoded signals to generate some of the plurality of audio output signals.

47. A method for processing a plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, the method comprising:

producing an initial plurality of low frequency input signals by removing frequencies that are above about the cut-off frequency from at least some of the plurality of audio input signals;

producing at least one low frequency input signal as a function of the initial low frequency input signals ~~such as the at least one low frequency input signal and the initial plurality of low frequency input signals comprises at least n+1 low frequency signals~~;

decoding, according to at least one matrix decoding technique, at least a part of the plurality of audio input signals into a plurality of decoded signals;

bypassing the at least one low frequency input signal and the initial plurality of low frequency input signals by the matrix decoding technique; and

generating the plurality of audio output signals based on the plurality of decoded signals and based on the at least one low frequency input signal and at least one of the initial plurality of low frequency input signals.

50. A vehicular sound processing system, comprising:

a signal source configured to produce a plurality of audio input signals;

a system in communication with the sound source and configured to decode the plurality of audio input signals into a plurality of audio output signals, ~~the plurality of audio input signals comprising n signals,~~ the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, the system comprising:

a bass management module in communication with the plurality of audio input signals, configured to produce ~~at least n+1~~ a plurality of initial low frequency input signals that comprises a portion of at least some of the plurality of audio input signals that is at most about a cut-off frequency and configured to produce at least one additional low frequency input signal as a function of at least one of the plurality of initial low frequency input signals;

at least one matrix decoder module in communication with the bass management module and configured to decode at least a part of the plurality of audio input signals into a plurality of [[m]] decoded signals; and

~~at least n+1~~ a plurality of low frequency input channels in communication with the bass management module configured to bypass the ~~at least n+1~~ plurality of initial low frequency input signals and the at least one additional low frequency input signal from any matrix decoder module, where the ~~at least n+1~~ plurality of initial low frequency input signals, the at least one additional low frequency input signal, and the plurality of decoded signals comprise the plurality of audio output signals; and

a plurality of speakers in communication with the system and configured to convert the plurality of audio output signals into a plurality of sound waves.

51. The vehicular sound processing system of claim 50, where the bass management module is configured to produce [[a]] the plurality of initial low frequency input signals that comprise portions of the plurality of audio input signals that are at most about a cut-off frequency; and

where the ~~at least n+1~~ plurality of low frequency input channels comprises a plurality of low frequency input channels configured to bypass the plurality of initial low frequency input signals and the at least one additional low frequency input signal by any matrix decoding technique.

52. The vehicular sound processing system of claim 51, where a number of the plurality of audio input signals is less than a number of the plurality of initial low frequency input signals~~; and~~

~~where the bass management module is configured to produce the plurality of low frequency inputs signals by producing a plurality of initial low frequency input signals that comprise portions of the n audio input signals that are at most about a cut-off frequency; and producing at least some of the plurality of low frequency input signals as a function of the initial low frequency input signals~~.

54. The vehicular sound processing system of claim 51, where a number of the plurality of initial low frequency input signals equals a number of the plurality of audio input signals; and

where the plurality of initial low frequency input signals is generated by filtering the plurality of audio input signals~~; and~~

~~where at least one of the plurality of low frequency input signals is produced as function of the initial low frequency input signals and a remainder of the plurality of low frequency input signals are identical to the initial low frequency input signals~~.

56. The vehicular sound processing system of claim 50, where the number of the plurality of initial low frequency input signals is less than the number of decoded signals; and

where each of the plurality of initial low frequency input signals are maintained separately from each other; and

where the plurality of initial low frequency input signals are combined with some of the corresponding decoded signals to generate some of the plurality of audio output signals.

58. A vehicular sound processing system, comprising:

a signal source configured to produce a plurality of audio input signals~~, the plurality of audio input signals comprising n signals~~;

a system in communication with the sound source and configured to decode the plurality of audio input signals into a plurality of audio output signals, the plurality of audio output signals ~~comprising m signals, where m>n~~ being a greater number than the plurality of audio input signals, the system comprising:

a bass management module in communication with the plurality of audio input signals, configured to produce [[n]] a plurality of initial low frequency input signals by removing frequencies that are above about the cut-off frequency from at least some of the plurality of audio input signals and to produce a plurality of additional low frequency input signals as a function of the initial low frequency input signals;

at least one matrix decoder module in communication with the bass management module and configured to decode at least a part of the plurality of audio input signals into a plurality of [[m]] decoded signals; and

a plurality of low frequency input channels in communication with the bass management module configured to bypass the [[n]] plurality of initial low frequency input signals and the [[m-n]] plurality of additional low frequency input signals from any matrix decoder module, where the [[n]] plurality of initial [[one]] low frequency input signals, the [[m-n]] plurality of additional low frequency input signals, and the plurality of decoded signals comprise the plurality of audio output signals; and

a plurality of speakers in communication with the system and configured to convert the plurality of audio output signals into a plurality of sound waves.

Allowable Subject Matter

1. Claims 4-10, 12-14, 17-24, 26-31, 33-58 are allowed.

2. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 4,8,10,17-21,28,29,35-39,44,47,49,50,51,55 and 58, prior art Gerzon discloses a surround sound apparatus. Prior art Waller discloses a dynamic spectral matrix surround system. Prior art Liu discloses audio bass management methods and circuits and systems using the same. Prior art Ito discloses a decoder for use in a 4-2-4 matrix playback system. Prior art Gerzon (US 5,594,800) discloses a sound reproduction system having a matrix converter.

Regarding claim 4, the prior art or combination thereof fails to disclose or make obvious producing at least one additional low frequency input signal from the plurality of initial low frequency input signals; bypassing decoding of the said plurality of initial low frequency input signals and the additional low frequency input signal by any matrix decoding technique; and

maintaining each of the said plurality of initial low frequency input signals and the additional low frequency input signal separately from each other, where the plurality of high frequency output signals, the plurality of initial low frequency input signals, and the additional low frequency input signal are included in the plurality of audio output signals.

Regarding claim 8,the prior art or combination thereof fails to disclose or make obvious where producing at lest one additional high frequency output signal comprises combining the plurality of low frequency input signals with the plurality of high frequency output signals.

Regarding claim 10, the prior art or combination thereof fails to disclose or make obvious where producing the plurality of low frequency input signals comprises producing an initial plurality of low frequency input signals; and producing the plurality of low frequency input signals as function of the initial low frequency input signals.

Regarding claim 17, the prior art or combination thereof fails to disclose or make obvious a method for processing a left-front input signal, a right-front input signal, a center audio input signal, a left-surround input signal, and a right-surround input signal into a left-front output signal, a right-front output signal, a center output signal, a left-side output signal, a right-side output signal, a left-rear output signal, and a right-rear output signal, the method comprising: producing an initial left -front low frequency input signal, an initial right-front low frequency input signal, an initial center low frequency input signal, an initial left-surround low frequency input signal, and an initial right-surround low frequency input signal by removing frequencies that are above about a cut-off frequency from the left-front, right-front, center, left-surround, and right-surround input signals, respectively; producing a left-front low frequency input signal, a right-front low frequency input signal, a center low frequency input signal, a left-side low frequency input signal, a right-side low frequency input signal, a left-rear low frequency input signal, and a right-rear low frequency input signal as a function of the initial left-front, initial right-front,

initial center, initial left-surround, and initial right-surround low frequency input signals; producing a left-front high frequency input signal, a right-front high frequency input signal, a center high frequency input signal, a left-surround high frequency input signal and a right-surround high frequency input signal by removing frequencies that are below about the cut\-off frequency from the left-front, right-front, center, left-surround, and right-surround input signals, respectively; decoding the left-front, right-front, center, left-surround, and right-surround high frequency input signals into a left-front high frequency output signal, a right-front high frequency output signal, a center high frequency output signal, a left-side high frequency output signal, a right-side high frequency output signal, a left-rear high frequency output signal, and a right-rear high frequency output signal according to a matrix decoding technique; causing the left-front, right-front, center, left-side, right-side, left-rear, and right-rear low frequency input signals to forgo the matrix decoding technique; and maintaining each of the left-front, right-front, center, left-side, right-side, left-rear, and right-rear low frequency input signals separately from each other, where left-front, right-front, center, left-side, right-side, left-rear, and right-rear low frequency input signals, and the left-front, right-front, center, left-side, right-side, left-rear, and right-rear high frequency output signals comprise the left-front, right-front, center, left-side, right-side, left-rear and right-rear output signals.

Regarding claim 18, the prior art or combination thereof fails to disclose or make obvious here the method for processing the plurality of audio input signals into a plurality of audio output signals comprises processing a left-front input signal, and a right-front input signal into a left-front output signal, a right-front, center output signal, a

left-surround output signal, and a right-surround output signal;

producing the plurality of low frequency input signals comprises producing a left-front low frequency input signal, and a right-front low frequency input signal by removing frequencies that are above about the cut-off frequency from the left-front, and right-front, input signals, respectively; and producing a further low frequency input signal as a function of the left-front, and right-front low frequency input signals;

producing the plurality of high frequency input signals comprises producing a left-front high frequency input signal, and a right-front high frequency input signal by removing frequencies that are below about the cut-off frequency from the left-front, and right-front input signals, respectively; decoding the plurality of high frequency input signals comprises decoding the left-front, and right-front high frequency input signals into a left-front high frequency output signal, a right-front high frequency output signal, a center high frequency output signal, a left-surround high frequency output signal, and a right-surround high frequency output signal according to the matrix decoding technique;

communicating the plurality of low frequency input signals comprises communicating the left-front, right-front, and further low frequency input signals so as to bypass any decoding by the matrix decoding technique; and maintaining each of the plurality of low frequency input signals separately from each other comprises maintaining each of the left-front, right-front, and further low frequency input signals separately from each other.

Regarding claim 21, the prior art or combination thereof fails to disclose or make obvious a bass management module in communication with the plurality of audio input signals configured to produce a plurality of initial low frequency input signals comprising

portions of the plurality of audio input signals that are at most about a cut-off frequency, produce at least one additional low frequency input signal from at least one of the plurality of initial low frequency input signals, and produce a plurality of high frequency input signals comprising portions of the plurality of audio input signals that are at least about the cut-off frequency;

a plurality of low frequency input channels in communication with the bass management module, configured to separately communicate each of the plurality of initial low frequency input signals and the additional low frequency input signal, and bypass any matrix decoder module, where the plurality of initial low frequency input signals, the at least one additional low frequency input signal, and the plurality of high frequency output signals comprise the plurality of audio output signals.

Regarding claim 28, the prior art or combination thereof fails to disclose or make obvious where the bass management module comprises a low-pass filter comprising the cut-off frequency, in communication with the plurality of audio input signals, and configured to produce one of the plurality of low frequency signals from a subset of the plurality of initial low frequency input signals.

Regarding claim 29, the prior art or combination thereof fails to disclose or make obvious where the plurality of audio input signals comprises a left-front input signal, a right-front input signal, and the low pass filter produces an initial left-front low frequency input signal, an initial right-front low frequency input signal, an initial center low frequency input signal, an initial left-surround low frequency input signal and an initial

right-surround low frequency input signal, and the bass management system further comprises: a first summation device in communication with and configured to produce a left-front low frequency input signal from the initial left-front, and initial center low-frequency input signals; a second summation device in communication with and configured to produce a right-front low frequency input signal from the initial fight-front and initial center low-frequency input signals; a third summation device in communication with and configured to produce a left-side low frequency input signal from the initial left-front, initial right-front, and initial left-surround low frequency input signals; and a fourth summation device in communication with and configured to produce the a fight-side low frequency input signal from the initial left-front, initial right-front, and initial right-surround low frequency input signals.

Regarding claim 35, the prior art or combination thereof fails to disclose or make obvious where the matrix decoder comprises an adjustment module in communication with at least one of the high frequency output signal and is configured to produce at least one additional high frequency output signal.

Regarding claim 36, the prior art or combination thereof fails to disclose or make obvious a matrix decoder module in communication with the bass management module, and configured to decode the left-front, and right-front high frequency input signals into a left-front high frequency output signal, a right-front high frequency output signal, a center high frequency output signal, a left-surround high frequency output signal, and a right-surround high frequency output signal.

Therefore the prior art or combination thereof fails to disclose or make obvious a method for processing a plurality of audio input signals, a method and system for processing a left front input signal, a right front input signal, a center audio input signal, a left surround input signal and a right surround input signal as claimed.

Regarding claim 37, the prior art or combination thereof fails to disclose or make obvious a bass management module in communication with the plurality of audio input signals, configured to produce a plurality of initial low frequency input signals comprising portions of the plurality of audio input signals that are at most about a cut-off frequency, an additional plurality of low frequency input signals from the plurality of initial low frequency input signals, and a plurality of high frequency input signals comprising portions of the plurality of audio input signals that are at least about the cut-off frequency;

a plurality of low frequency input channels in communication with the bass management module configured to separately communicate each of the plurality of initial low frequency input signals and the additional plurality of low frequency input signals, and bypass any matrix decoder module, where the plurality of initial low frequency input signals, the additional plurality of low frequency input signals, and the plurality of high frequency output signals comprise the plurality of audio output signals.

Regarding claim 38, the prior art or combination thereof fails to disclose or make obvious bass management means for producing a plurality of initial low-frequency input

signals that include portions of the plurality of audio input signals that are at most about a cut-off frequency, an additional plurality of low frequency input signals from the plurality of initial low frequency input signals, and means for separately communicating each of the plurality of initial low frequency input signals and the additional low frequency input signals, and bypassing any matrix decoder means, where the plurality of initial low frequency input signals, the additional plurality of low frequency input signals, and the plurality of high frequency output signals comprise the plurality of audio output signals.

Regarding claim 39 the prior art fails to disclose or make obvious producing a plurality of initial low frequency input signals that comprises portions of at least some of the plurality of audio input signals that is at most about a cut-off frequency; producing at least one additional low frequency input signal as a function of at least one of the plurality of initial low frequency input signals; bypassing the plurality of initial low frequency input signals and the at least one additional low frequency input signal by any matrix decoding technique; and generating the plurality of audio output signals based on the plurality of decoded signals, based on the at least one additional low frequency signal, and based on the at plurality of initial low frequency input signals.

Regarding claim 44 the prior art or combination thereof fails to disclose or make obvious where decoding comprises decoding from a lesser number of input signals to a greater number of decoded signals; where a number of low frequency input signals is equal to the number of decoded signals; where each of the plurality of low frequency input signals are maintained separately from each other; and where the low frequency

input signals are combined with corresponding decoded signals to generate the plurality of audio output signals.

Regarding claim 47, the prior art or combination thereof fails to disclose or make obvious producing an initial plurality of low frequency input signals by removing frequencies that are above about the cut-off frequency from at least some of the plurality of audio input signals; producing at least one low frequency input signal as a function of the initial low frequency input signal; bypassing the at least one low frequency input signal and the initial plurality of low frequency input signals by the matrix decoding technique; and generating the plurality of audio output signals based on the plurality of decoded signals and based on the at least one low frequency input signal and at least one of the initial plurality of low frequency input signals.

Regarding claim 49, the prior art or combination thereof fails to disclose or make obvious producing a plurality of low frequency input signals as a function of the initial low frequency input signals and where one of the plurality of low frequency input signals includes a SUB signal comprising a summation of all of the initial low frequency input signals.

Regarding claim 50, the prior art or combination thereof fails to disclose or make obvious a bass management module in communication with the plurality of audio input signals, configured to produce a plurality of initial low frequency input signals that comprises a portion of at least some of the plurality of audio input signals that is at most about a cut-off frequency and configured to produce at least one additional low

frequency input signal as a function of at least one of the plurality of initial low frequency input signals; and a plurality of low frequency input channels in communication with the bass management module configured to bypass the plurality of initial low frequency input signals and the at least one additional low frequency input signal from any matrix decoder module, where the plurality of initial low frequency input signals, the at least one additional low frequency input signal, and the plurality of decoded signals comprise the plurality of audio output signals.

Regarding claim 55, the prior art or combination thereof fails to disclose or make obvious where the matrix decoder is configured to decode from a lesser number of input signals to a greater number of decoded signals; where the number of low frequency input signals is equal to the number of decoded signals; where each of the plurality of low frequency input signals are maintained separately from each other; and where the low frequency input signals are combined with corresponding decoded signals to generate the plurality of audio output signals.

Regarding claim 58, the prior art or combination thereof fails to disclose or make obvious a bass management module in communication with the plurality of audio input signals, configured to produce a plurality of initial low frequency input signals by removing frequencies that are above about the cut-off frequency from at least some of the plurality of audio input signals and to produce a plurality of additional low frequency input signals as a function of the initial low frequency input signals; and a plurality of low frequency input channels in communication with the bass management module configured to bypass the plurality of initial low frequency input signals and the plurality

of additional low frequency input signals from any matrix decoder module, where the [[n]] plurality of initial low frequency input signals, the plurality of additional low frequency input signals, and the plurality of decoded signals comprise the plurality of audio output signals.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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